

Aufgabe 3

a) $A\tilde{x} = \tilde{b}$

Für $n=4$

$$\Rightarrow \left(\begin{array}{cccc|c} -2 & 1 & 0 & 0 & 1 \\ 1 & -2 & 1 & 0 & 1 \\ 0 & 1 & -2 & 1 & 1 \\ 0 & 0 & 1 & -2 & 1 \end{array} \right) \cdot 2 \leftarrow +I$$

$$\left(\begin{array}{cccc|c} -2 & 1 & 0 & 0 & 1 \\ 0 & -3 & 2 & 0 & 3 \\ 0 & 1 & -2 & 1 & 1 \\ 0 & 0 & 1 & -2 & 1 \end{array} \right) \cdot 3 \leftarrow +II$$

$$\left(\begin{array}{cccc|c} -2 & 1 & 0 & 0 & 1 \\ 0 & -3 & 2 & 0 & 3 \\ 0 & 0 & -4 & 3 & 6 \\ 0 & 0 & 1 & -2 & 10 \end{array} \right) \cdot 4 \leftarrow +III$$

$$\left(\begin{array}{cccc|c} -2 & 1 & 0 & 0 & 1 \\ 0 & -3 & 2 & 0 & 3 \\ 0 & 0 & -4 & 3 & 6 \\ 0 & 0 & 0 & -5 & 10 \end{array} \right)$$

$$\Rightarrow -5d = 10 \Rightarrow d = -2$$

$$\hookrightarrow -4c + 3(-2) = 6 \Rightarrow c = -3$$

$$\hookrightarrow -3b + 2(-3) = 3 \Rightarrow b = -3$$

$$\hookrightarrow -2a + (-3) = 1 \Rightarrow a = -2$$

$$\Rightarrow A\tilde{x} \cdot \tilde{b} = (-2, -3, -3, -2)$$